



# Energy Conservation & Demand Management Plan 2024



**PORT COLBORNE**

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# 1. Regulatory Update

**O. Reg. 397/11: Conservation and Demand Management Plans** was introduced in 2013. Under this regulation, public agencies were required to report on energy consumption and greenhouse gas (GHG) emissions and develop Conservation and Demand Management (CDM) plans the following year.

Until recently, O. Reg. 397/11 was housed under the Green Energy Act, 2009 (GEA). On December 7, 2018, the Ontario government passed Bill 34, Green Energy Repeal Act, 2018. The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11. However, it re-enacted various provisions of the GEA under the Electricity Act, 1998.

As a result, the conservation and energy efficiency initiatives, namely CDM plans and broader public sector energy reporting, were re-introduced as amendments to the Electricity Act. The new regulation is now called **O. Reg. 507/18: Broader Public Sector: Energy Conservation and Demand Management Plans (ECDM)**.

As of January 1, 2019, O. Reg. 397/11 was replaced by O. Reg. 507/18, and BPS reporting and ECDM plans are under the Electricity Act, 1998 rather than the Green Energy Act, 2009.

As of February 23, 2023, O. Reg. 507/18 was replaced by **O. Reg. 25/23, and BPS reporting and ECDM Plans** are under the Electricity Act, 1998 rather than the Green Energy Act, 2009.

## 2. Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from The City of Port Colborne (COPC) is to outline specific actions and measures that will promote good stewardship of our environment and community resources in the years to come. The Plan will accomplish this, in part, by looking at future projections of energy consumption and reviewing past conservation measures.

In keeping with COPC's core values of efficiency, concern for the environment and financial responsibility, this ECDM outlines how COPC will reduce overall energy consumption, operating costs and greenhouse gas emissions. By following the measures outlined in this document, we will be able to provide compassionate service to more people in the community. This ECDM Plan is written in accordance with O. Reg. 25/23 of the recently amended Electricity Act, 1998.

Through past conservation and demand initiatives, COPC has achieved the following results since 2019:

- 1,007,475kwh reduction in electricity use
- 65,231m<sup>3</sup> reduction in natural gas use

Today, utility and energy related costs are a significant part of overall operating costs. In 2023:

- Energy Use Index (EUI) was 30.60 ekWh/sq.ft
- Energy-related emissions equaled 1,223 tCO<sub>2</sub>e

To obtain full value from energy management activities, COPC will take a strategic approach to fully integrate energy management into its business decision-making, policies, and operating procedures. This active management of energy-related costs and risks will provide a significant economic return and will support other key organizational objectives.

With this prominent focus on energy management, by implementing recommended initiatives, COPC can expect to achieve the following targets by 2029, compared with 2023:

- 51% reduction in electricity consumption
- 46% reduction in natural gas consumption
- 37% reduction in GHG emissions

## City of Port Colborne's Energy Performance and Path Forward

The results and the progress of the ECDM activities implemented over the past 5 years, and the projected impact of the new ECDM Plan is presented in the graph below.

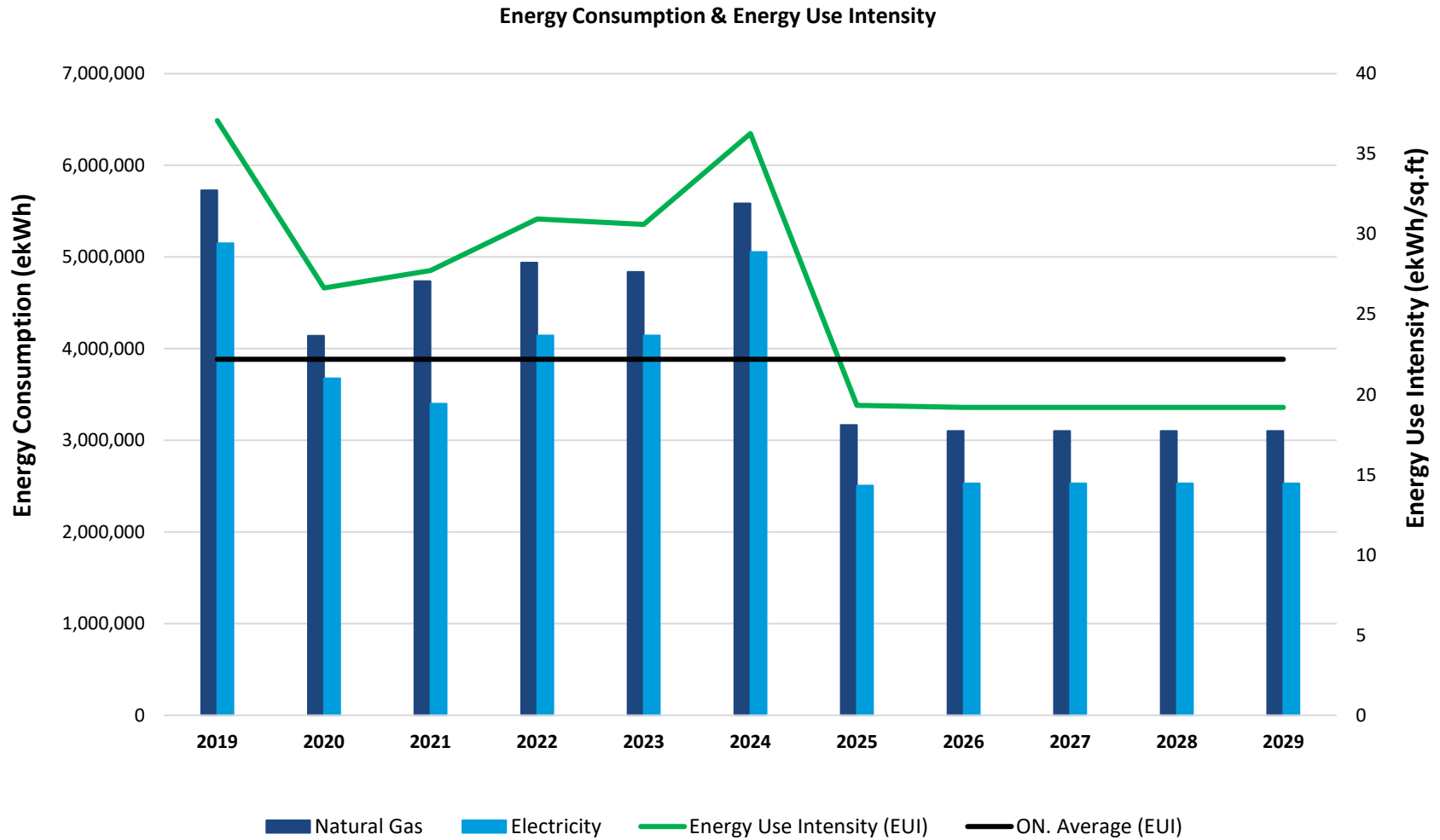


Figure 1. Energy Consumption Trends & Projections



### 3. About The City of Port Colborne



*Figure 2. City of Port Colborne*

The City of Port Colborne is located in Southern Ontario in the Niagara Region on Lake Erie. The City has a population of 20,033 people and is an emerging tourism sector with significant investment opportunities. Additionally, due to its proximity to the U.S. Border, only 20 minutes away, The City is accessible by highway, railway, and shipping canal. The Welland Canal provides competitive advantages to businesses located in Port Colborne, connecting them to ports throughout the Great Lakes and the Atlantic Ocean.

**Our Mission:**

To provide an exceptional small-town experience in a big way

**Our Vision:**

A healthy and vibrant waterfront community embracing growth for future generations

**Our Values**

Integrity – We interact with others ethically and honorably

Respect – We treat each other with empathy and understanding

Inclusion – We welcome everyone

Responsibility – we make tomorrow better

Collaboration – We are better together

## 4. Site-Wide Historical Analysis

### 4.1. Site-Wide Historical Energy Intensity

Energy Utilization Index is a measure of how much energy a facility uses per square foot. By breaking down a facility's energy consumption on a per-square-foot-basis, we can compare facilities of different sizes with ease. In this case, we are comparing our facilities to the industry average for Ontario Municipalities in general (derived from Natural Resources Canada's Commercial and Institutional Consumption of Energy Survey), which was found to be 22.19 ekWh/sq. ft.

Site	2019	2020	2021	2022	2023
City Hall	22.15	22.23	22.86	21.28	18.68
Eng & Ops Centre	33.44	29.31	30.50	32.58	28.08
Firehall	28.70	24.12	23.16	22.56	21.65
First Roselawn	6.11	4.43	4.95	5.69	5.42
Harbour Master	9.59	4.30	3.34	6.90	7.30
Library	13.86	12.64	11.95	12.90	11.97
Lions Field Park Canteen	6.58	4.69	7.94	3.79	3.74
Marine Lighthouse Exhibit	24.20	19.46	23.65	22.67	22.41
Museum (includes Archives, HRC, & Tea Room)	11.57	11.09	12.66	12.19	9.59
Roselawn Centre	37.71	31.68	33.74	38.80	35.36
Tourism Information Centre	14.58	10.41	12.38	12.59	13.70
Sugarloaf Marina	45.49	37.12	40.87	41.13	37.92
VHWC	48.84	31.95	33.40	39.38	41.11
<b>Total</b>	<b>36.38</b>	<b>26.63</b>	<b>27.73</b>	<b>30.94</b>	<b>30.60</b>

Table 1. Historic Energy Use Intensity

### Annual Consumption (EUI)

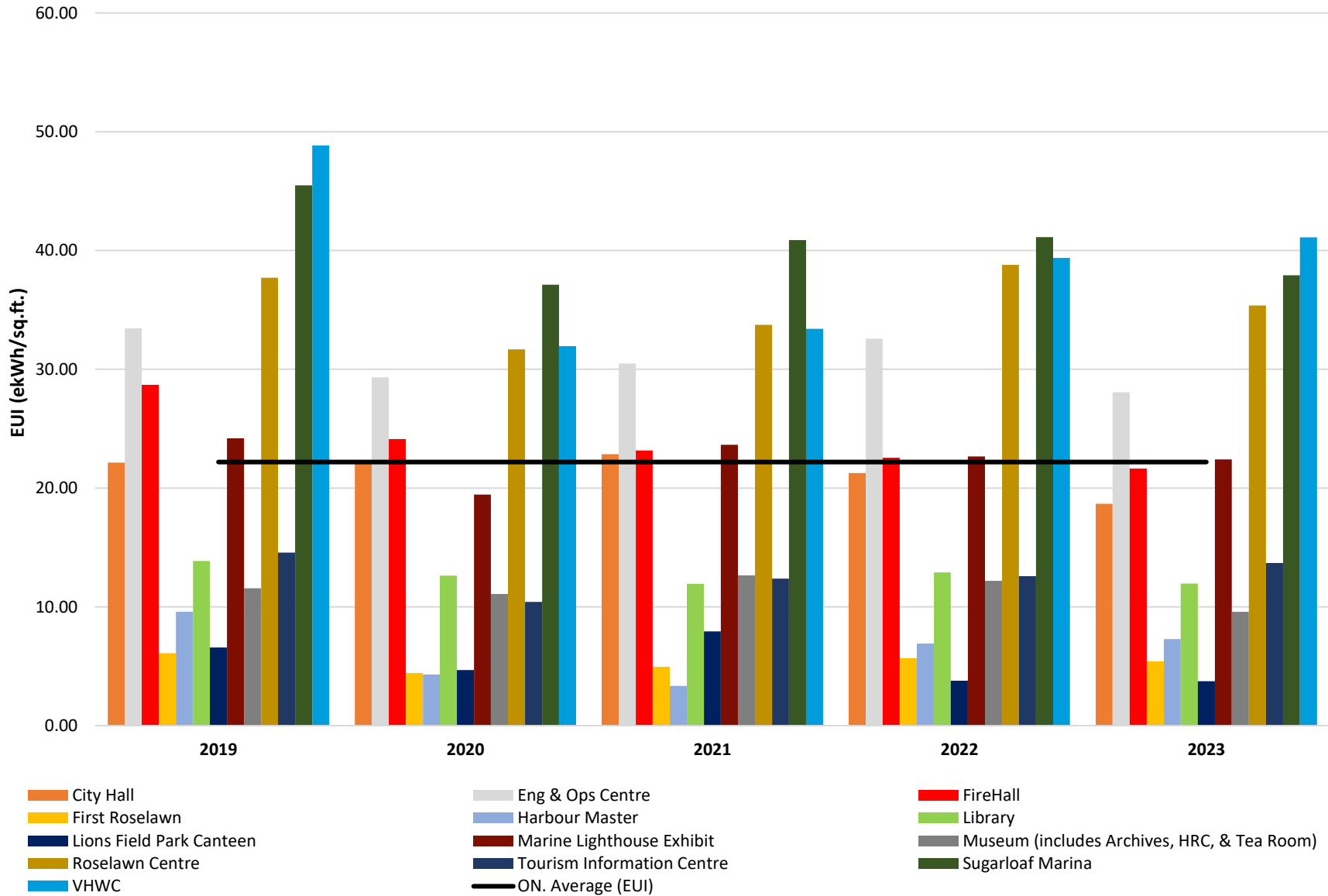


Figure 3. Historic Annual Energy Utilization Indices



## 4.2. Site-Wide Historical GHG Emissions

Greenhouse gas (GHG) emissions are expressed in terms of equivalent tonnes of Carbon Dioxide (tCO<sub>2</sub>e). The GHG emissions associated with a facility are dependent on the fuel source — for example, hydroelectricity produces fewer greenhouse gases than coal-fired plants, and light fuel oil produces fewer GHGs than heavy oil.

Electricity from the grid in Ontario is relatively “clean”, as the majority is derived from low-GHG nuclear power and hydroelectricity, and coal-fired plants have been phased out. Scope 1 (such as natural gas directly used in facilities), and Scope 2 (such as purchased electricity) consumptions have been converted to their equivalent tonnes of greenhouse gas emissions in the table below. Scope 1 represents the direct emissions from sources owned or controlled by the institution, and Scope 2 consists of indirect emissions from the consumption of purchased energy generated upstream from the institution.

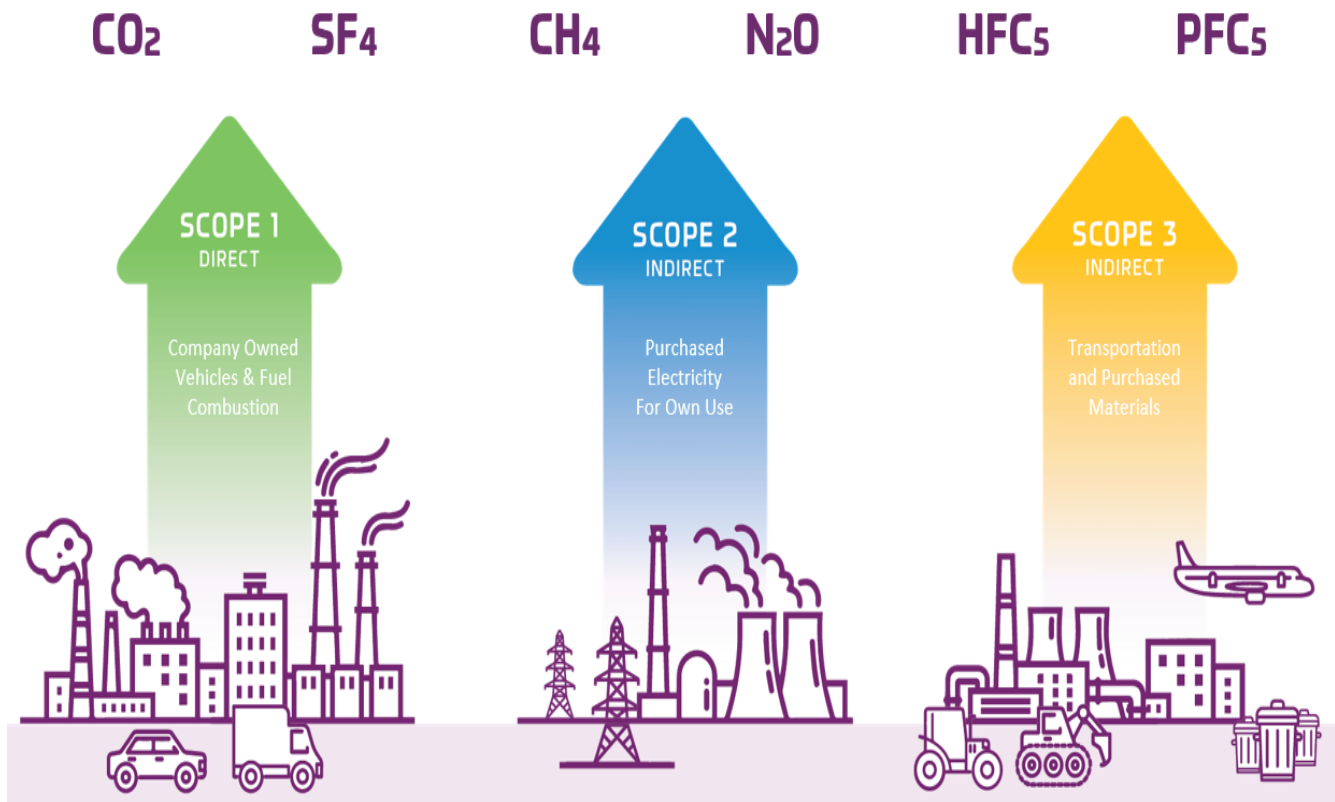


Figure 4. Examples of Scope 1 and 2

The greenhouse gas emissions for COPC have been tabulated and are represented in the table and graph below.

GHG Emissions (tCO <sub>2</sub> e)	2019	2020	2021	2022	2023
Natural Gas (scope 1)	1,005	753	862	898	880
Electricity (scope 2)	129	95	89	292	343
<b>Total Scope 1 &amp; 2 Emissions</b>	<b>1,134</b>	<b>848</b>	<b>951</b>	<b>1,191</b>	<b>1,223</b>

Table 2. Historic Greenhouse Gas Emissions for all sites

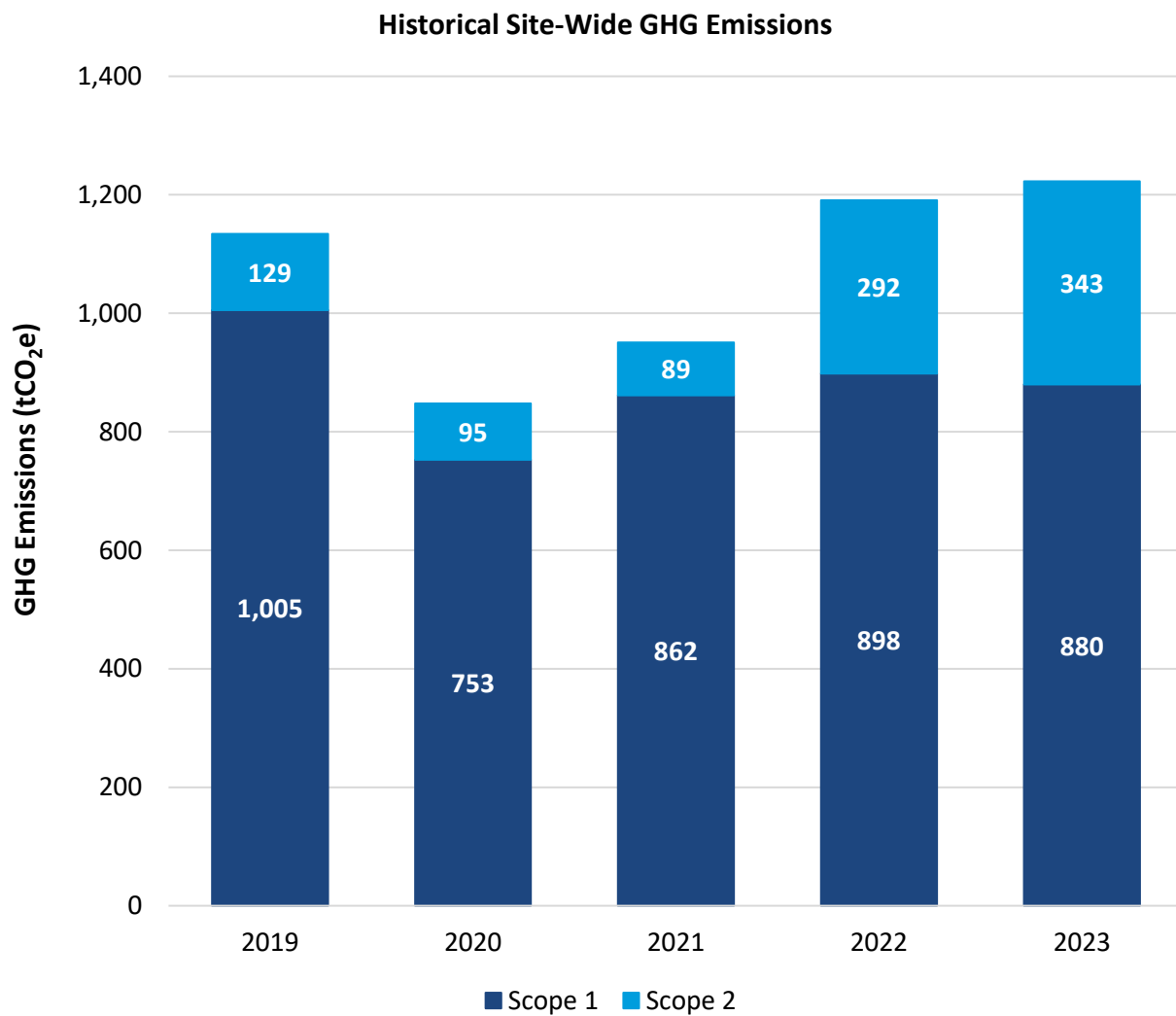


Figure 5. Historical GHG Emissions for all sites

# 5. Site Type Analysis

The following section will provide data for each building type by sector for consumption, GHG and proposed energy conservation measures.

## 5.1. Utility Consumption Analysis

Utilities to the site are electricity and natural gas. The following table summarizes the accounts for each utility. Consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

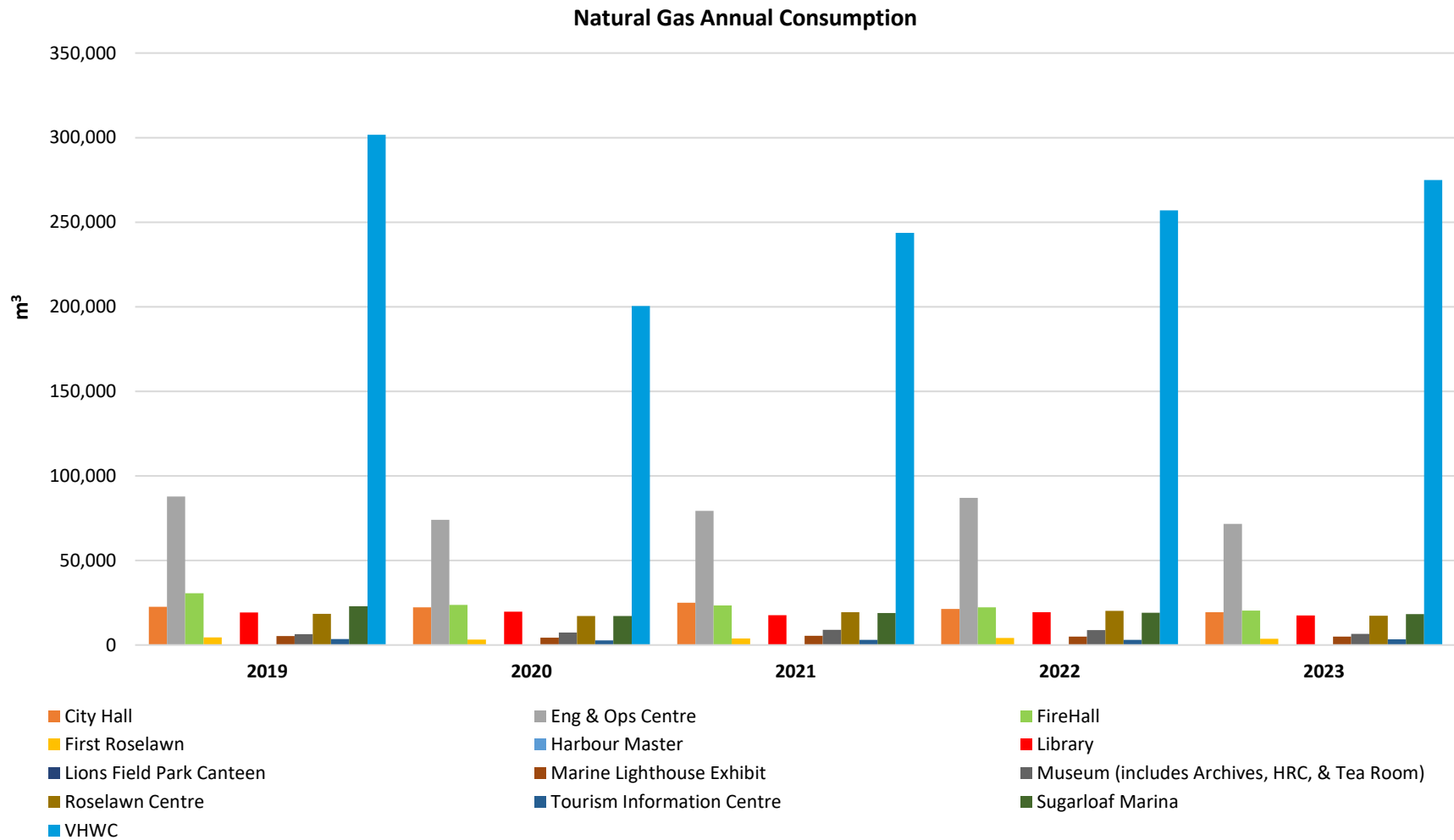


Figure 6. Historical Natural Gas Consumption

### Electricity Annual Consumption

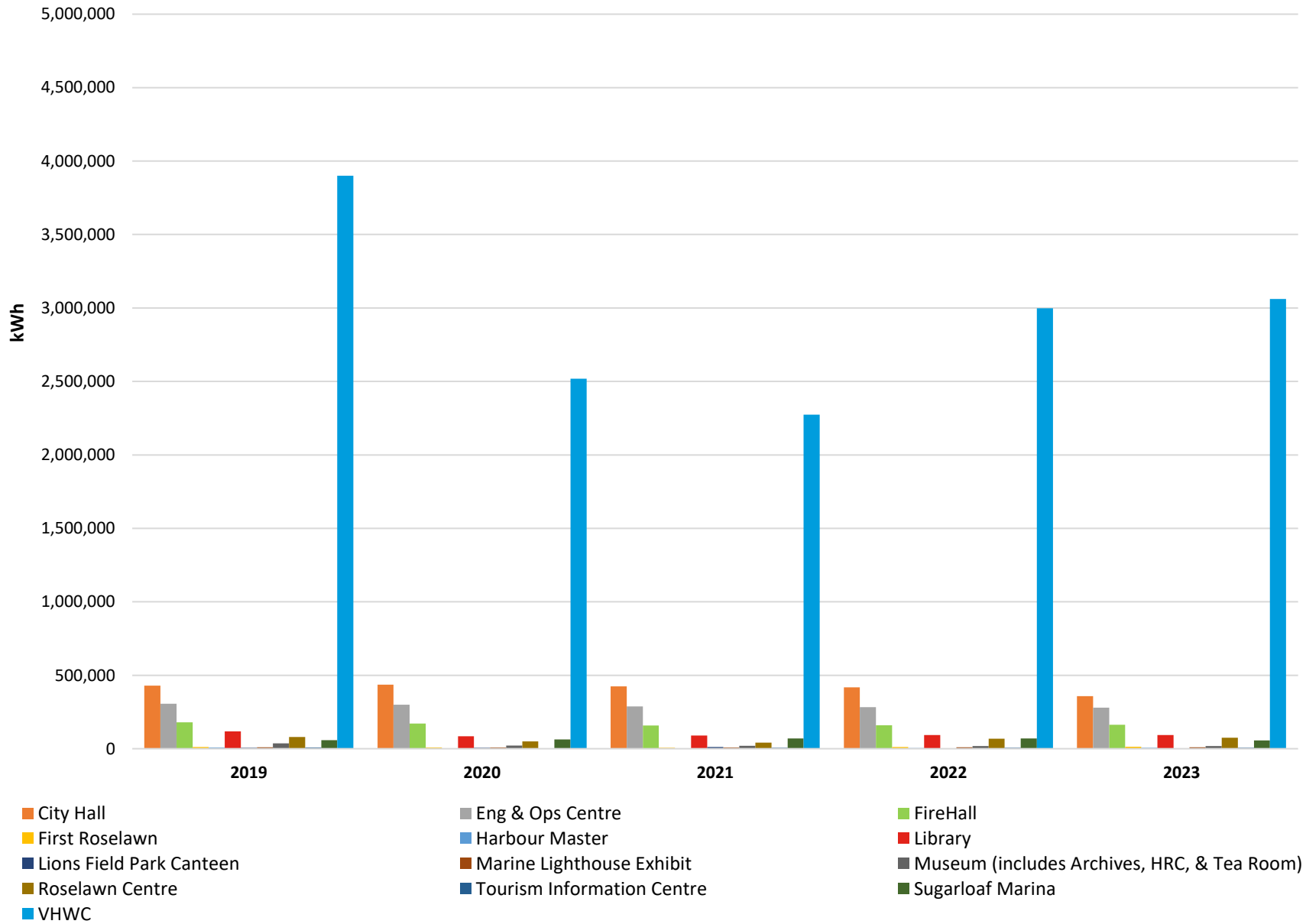


Figure 7. Historical Electricity Consumption

Natural Gas (m <sup>3</sup> )	2019	2020	2021	2022	2023
City Hall	22,635	22,203	25,042	21,256	19,445
Eng & Ops Centre	87,864	73,941	79,259	86,964	71,557
FireHall	30,549	23,685	23,451	22,336	20,390
First Roselawn	4,496	3,267	3,843	4,208	3,747
Harbour Master	0	0	0	0	0
Library	19,168	19,639	17,684	19,414	17,426
Lions Field Park Canteen	325	12	10	220	162
Marine Lighthouse Exhibit	5,341	4,346	5,375	4,938	4,932
Museum (includes Archives, HRC, & Tea Room)	6,458	7,426	8,948	8,817	6,505
Roselawn Centre	18,412	17,087	19,339	20,263	17,283
Tourism Information Centre	3,510	2,699	3,089	3,078	3,415
Sugarloaf Marina	22,869	17,145	18,878	19,048	18,259
VHWC	301,648	200,495	243,639	257,028	274,924
<b>Total</b>	<b>523,275</b>	<b>391,945</b>	<b>448,557</b>	<b>467,570</b>	<b>458,044</b>

Electricity (kWh)	2019	2020	2021	2022	2023
City Hall	428,945	435,818	424,880	417,146	358,041
Eng & Ops Centre	305,410	300,089	287,673	282,994	279,693
FireHall	179,636	172,002	157,737	159,020	163,500
First Roselawn	11,702	8,408	7,352	10,753	12,939
Harbour Master	7,745	3,473	2,701	5,577	5,895
Library	118,258	85,028	89,692	93,523	92,804
Lions Field Park Canteen	5,845	6,489	11,090	3,029	3,571
Marine Lighthouse Exhibit	10,047	7,540	8,191	10,117	9,465
Museum (includes Archives, HRC, & Tea Room)	36,682	22,109	20,279	17,436	18,238
Roselawn Centre	79,677	49,894	41,032	68,055	74,578
Tourism Information Centre	8,468	4,010	6,032	6,819	6,740
Sugarloaf Marina	57,384	62,836	69,162	69,096	56,323
VHWC	3,900,722	2,518,479	2,273,141	2,998,419	3,061,260
<b>Total</b>	<b>5,150,521</b>	<b>3,676,175</b>	<b>3,398,962</b>	<b>4,141,983</b>	<b>4,143,046</b>

Table 3. Historic Natural Gas & Electricity Consumption

## 5.2. GHG Emissions Analysis

The greenhouse gas emissions are calculated based on the energy consumption data analyzed in the following table.

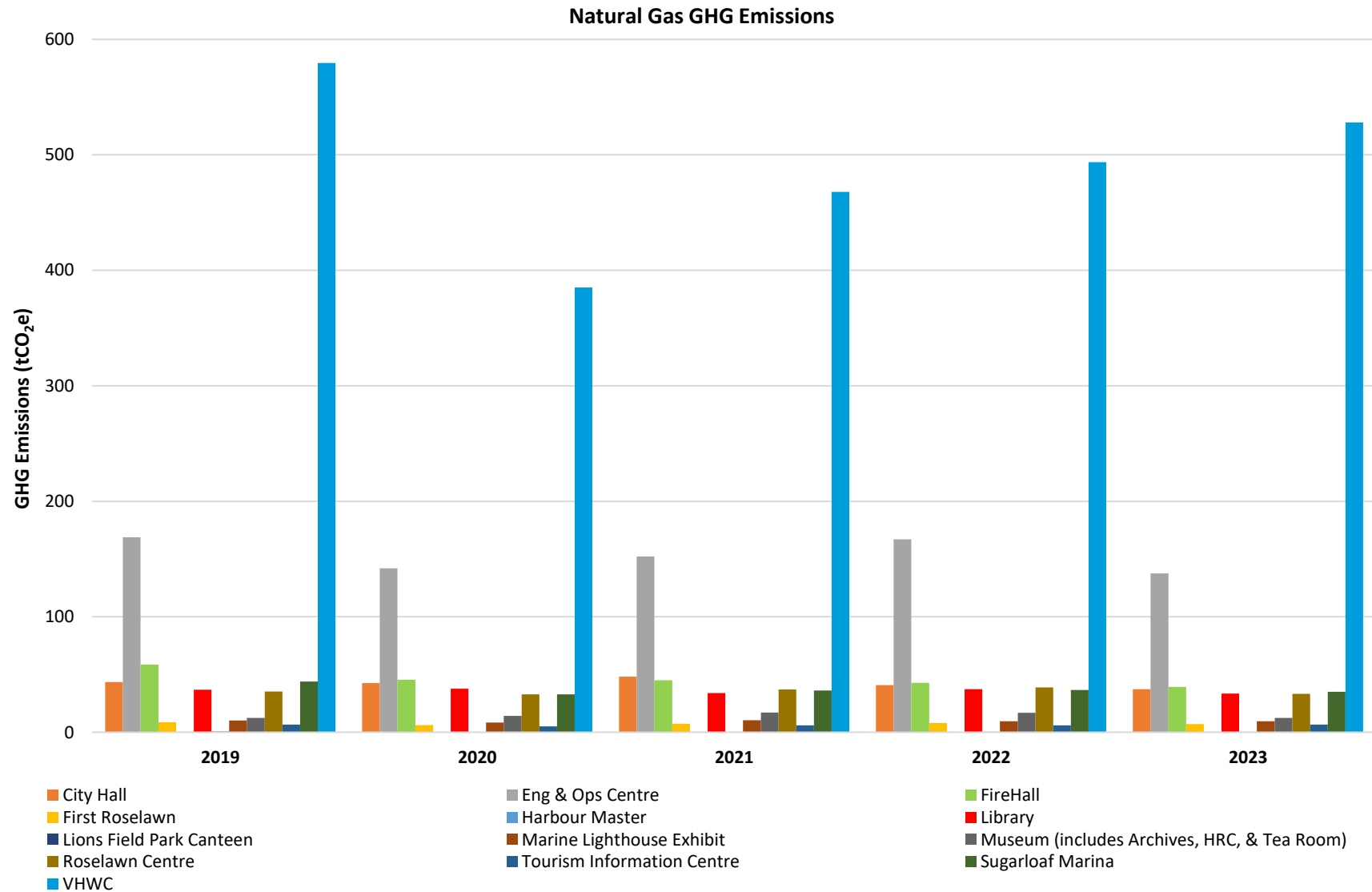


Figure 8. Historic Natural Gas GHG Emissions



### Electricity GHG Emissions

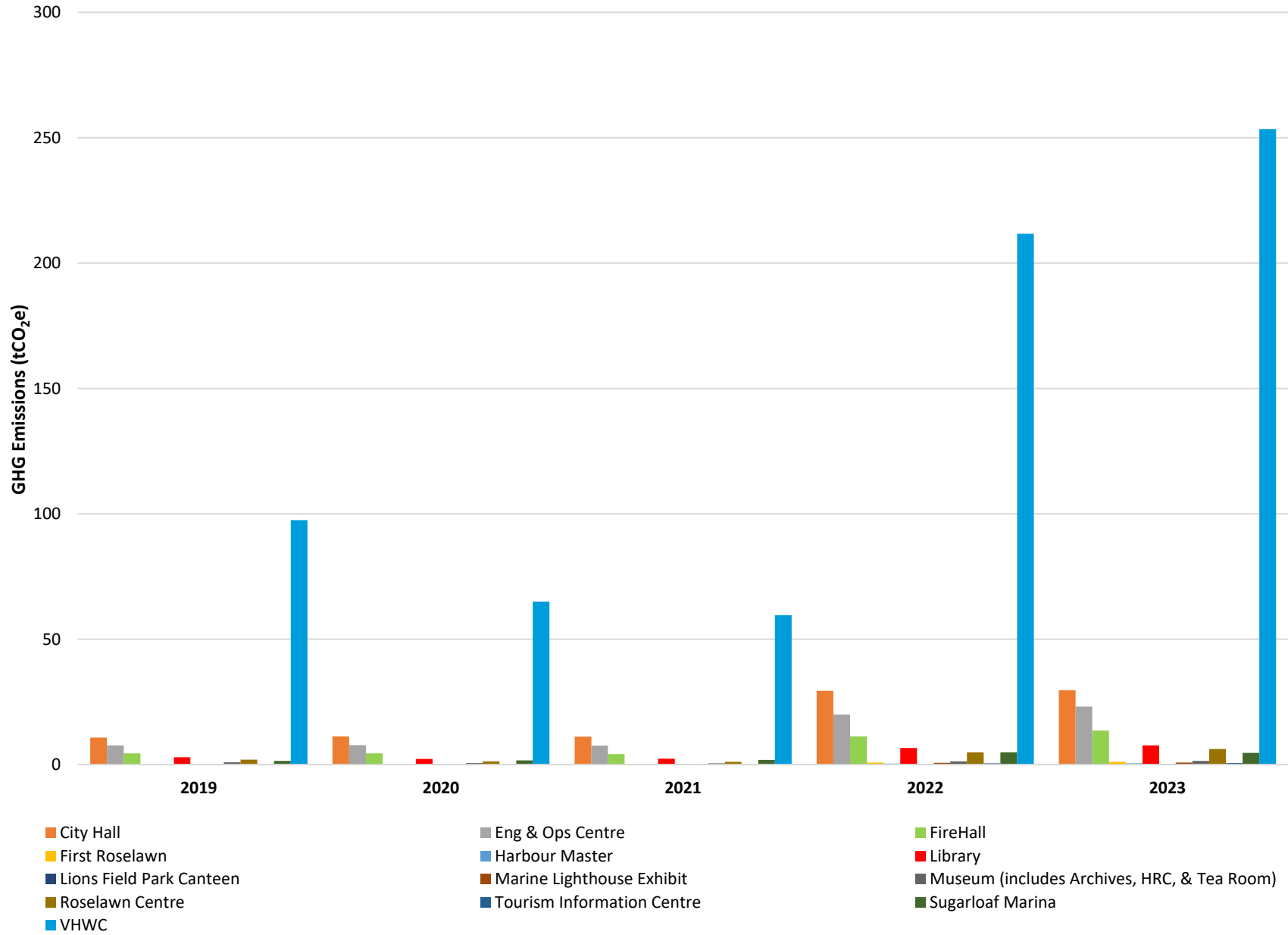


Figure 9. Historic Electricity GHG Emissions

NG Emissions (tCO <sub>2</sub> e)	2019	2020	2021	2022	2023
City Hall	43	43	48	41	37
Eng & Ops Centre	169	142	152	167	137
Firehall	59	45	45	43	39
First Roselawn	9	6	7	8	7
Harbour Master	0	0	0	0	0
Library	37	38	34	37	33
Lions Field Park Canteen	1	0	0	0	0
Marine Lighthouse Exhibit	10	8	10	9	9
Museum (includes Archives, HRC, & Tea Room)	12	14	17	17	12
Roselawn Centre	35	33	37	39	33
Tourism Information Centre	7	5	6	6	7
Sugarloaf Marina	44	33	36	37	35
VHWC	579	385	468	494	528
<b>Total</b>	<b>1,005</b>	<b>753</b>	<b>862</b>	<b>898</b>	<b>880</b>

Electricity Emissions (tCO <sub>2</sub> e)	2019	2020	2021	2022	2023
City Hall	11	11	11	29	30
Eng & Ops Centre	8	8	8	20	23
Firehall	4	4	4	11	14
First Roselawn	0	0	0	1	1
Harbour Master	0	0	0	0	0
Library	3	2	2	7	8
Lions Field Park Canteen	0	0	0	0	0
Marine Lighthouse Exhibit	0	0	0	1	1
Museum (includes Archives, HRC, & Tea Room)	1	1	1	1	2
Roselawn Centre	2	1	1	5	6
Tourism Information Centre	0	0	0	0	1
Sugarloaf Marina	1	2	2	5	5
VHWC	98	65	60	212	253
<b>Total</b>	<b>129</b>	<b>95</b>	<b>89</b>	<b>292</b>	<b>343</b>

Table 4. Historic Natural Gas & Electricity GHG Emissions

### 5.3. Proposed Conservation Measures

Our energy analysis has revealed several potential conservation strategies for the facility. The proposed energy saving initiatives are summarized in the table below outlining the targeted utilities. These measures may remain in place until a more efficient and cost-effective technology is found. All proposed measures will be further reviewed with the City's Building Condition Assessments and feasibility studies to determine if projects will be recommended. Implementation year is a placeholder until City staff finalize review and assessment of the measures.

Site Category	Measure	Estimated Annual Savings			Project Cost (\$)	Simple Payback (Years)	Proposed Implementation Year (under review)
		Electricity (kWh)	Natural Gas (m3)	Cost (\$)			
City Hall	BAS Recommissioning, Integration & Optimization	21,447	1,132	\$4,008	\$13,970	3.5	2025
	Replace Gas fired Furnace and AC to Air-to-Air Heat Pump	-17,242	4,082	-\$1,625	\$36,322	N/A	2025
	Replace Gas fired RTU-s with Heat Pump RTUs	-68,966	16,327	-\$6,500	\$132,715	N/A	2025
	<b>Sub-total</b>	<b>-64,760</b>	<b>21,541</b>	<b>-\$4,116</b>	<b>\$183,007</b>	<b>N/A</b>	<b>-</b>
Eng & Ops Centre	BAS Recommissioning	11,981	4,458	\$4,122	\$41,910	10.2	2025
	VRV System Optimization	7,852	0	\$1,390	\$29,337	21.1	2025
	Recommission existing Lighting Control System	10,231	0	\$1,811	\$7,893	4.4	2025
	Install Low Flow Fixtures	0	372	\$972	\$11,386	11.7	2024
	Install 240 kW Solar PV System (investigate feasibility)	291,400	0	\$51,578	\$580,800	11.3	2025
	<b>Sub-total</b>	<b>321,464</b>	<b>4,830</b>	<b>\$59,872</b>	<b>\$671,326</b>	<b>11.2</b>	<b>-</b>
Firehall	Lighting Retrofit	5,181	0	\$881	\$9,194	10.4	2024
	Install Air to Water HP for Heating/cooling and leave boiler as backup	-89,730	21,243	-\$8,456	\$642,620	N/A	2025
	Install Energy STAR windows (triple pane with shading) for entrance	3,592	560	\$790	\$48,895	61.9	2025
	Replace NG Dryers to Electric/Heat Pump Dryers	-4,646	1,100	-\$438	\$13,970	N/A	2025
	Solar PV Rooftop or field (investigate feasibility)	55,250	0	\$9,393	\$133,100	14.2	2025
	<b>Sub-total</b>	<b>-30,353</b>	<b>22,903</b>	<b>\$2,727</b>	<b>\$847,779</b>	<b>221.5</b>	<b>-</b>
Library	Replace Gas Fired RTU's with HP RTU	-70,600	16,714	-\$6,653	\$189,992	N/A	2025
	Solar PV Rooftop	33,000	0	\$5,610	\$75,020	13.4	2024
	<b>Sub-total</b>	<b>-37,600</b>	<b>16,714</b>	<b>\$1,043</b>	<b>\$265,012</b>	<b>13.4</b>	<b>-</b>

Museum (includes Archives, HRC, & Tea Room)	Lighting Retrofit	4,953	0	\$545	\$20,955	38.5	2024
	Smart Thermostat	1,945	564	\$400	\$2,794	7.0	2024
	Replace Gas fired Furnace and AC to Air-to-Air Heat Pump	-21,432	5,074	-\$911	\$60,071	N/A	2024
	<b>Sub-total</b>	<b>-14,534</b>	<b>5,638</b>	<b>\$34</b>	<b>\$83,820</b>	<b>2467.3</b>	<b>-</b>
Roselawn Centre	Install Smart Thermostats	4,571	1,190	\$884	\$3,772	4.3	2024
	Replace Gas Fired Boilers with Air to Water HP	-25,633	6,068	-\$878	\$132,715	N/A	2026
	Replace Gas Fired RTU with HP	-33,644	7,965	-\$1,152	\$106,172	N/A	2025
	Solar PV Rooftop	35,000	0	\$3,850	\$77,440	20.1	2025
	<b>Sub-total</b>	<b>-19,706</b>	<b>15,223</b>	<b>\$2,704</b>	<b>\$320,099</b>	<b>118.4</b>	<b>-</b>
Tourism Information Centre	Lighting Retrofit	2,659	-111	\$257	\$12,384	48.2	2024
	Replace Gas Fired Boiler with Air to Water HP	-13,344	3,159	-\$457	\$76,835	N/A	2025
	<b>Sub-total</b>	<b>-10,685</b>	<b>3,048</b>	<b>-\$200</b>	<b>\$89,219</b>	<b>N/A</b>	<b>-</b>
Sugarloaf Marina	Replace Gas Fired RTU's with HP RTUs	-21,521	5,095	-\$737	\$174,625	N/A	2025
	Replace Gas Fired Boilers with Air to Water HP	-40,172	9,510	-\$1,376	\$160,655	N/A	2025
	Solar PV Rooftop	10,590	0	\$1,165	\$24,200	20.8	2025
	Solar Carport	44,000	0	\$4,840	\$158,400	32.7	2025
	<b>Sub-total</b>	<b>-7,103</b>	<b>14,605</b>	<b>\$3,892</b>	<b>\$517,880</b>	<b>133.0</b>	<b>-</b>
VHWC	Replace Cooling Tower (completed)	34,791	0	\$6,088	\$393,954	64.7	2024
	BAS Recommissioning	219,416	22,873	\$45,946	\$83,820	1.8	2025
	Air Source Heat Pumps for Summer Heating	-97,154	41,875	-\$3,183	\$162,052	N/A	2025
	Replace DHW Boilers with Heat Pumps	-163,137	70,315	-\$5,345	\$301,752	N/A	2025
	Recommission existing Lighting Controls System	53,291	0	\$9,326	\$59,861	6.4	2025
	Optimize AHU's Schedule	18,239	0	\$3,192	\$699	0.2	2024
	Install Low Flow Fixtures	0	4,636	\$6,690	\$58,395	8.7	2024
	investigate Install 950 kW Solar Rooftop PV System	1,215,000	0	\$212,625	\$2,403,500	11.3	2025
Install 1 MW Solar PV Carport System	1,192,000	0	\$208,600	\$5,500,000	26.4	2025	
	<b>Sub-total</b>	<b>2,472,446</b>	<b>139,699</b>	<b>\$483,939</b>	<b>\$8,964,033</b>	<b>18.5</b>	<b>-</b>
<b>TOTAL – All Sites Conservation Measures</b>		<b>2,619,524</b>	<b>248,777</b>	<b>550,475</b>	<b>13,404,889</b>	<b>-</b>	<b>-</b>

Table 5. Targeted Utilities and Proposed Conservation Measures for the Metropolitan Campus

## 5.4. Utility Consumption Forecast

By implementing the energy conservation measures stated in the previous section, the forecasted electricity and natural gas use could be forecasted based on the utility savings generated from individual measures. The forecasted utility consumption is tabulated below. The percentage of change is based off the data from the baseline year of 2023.

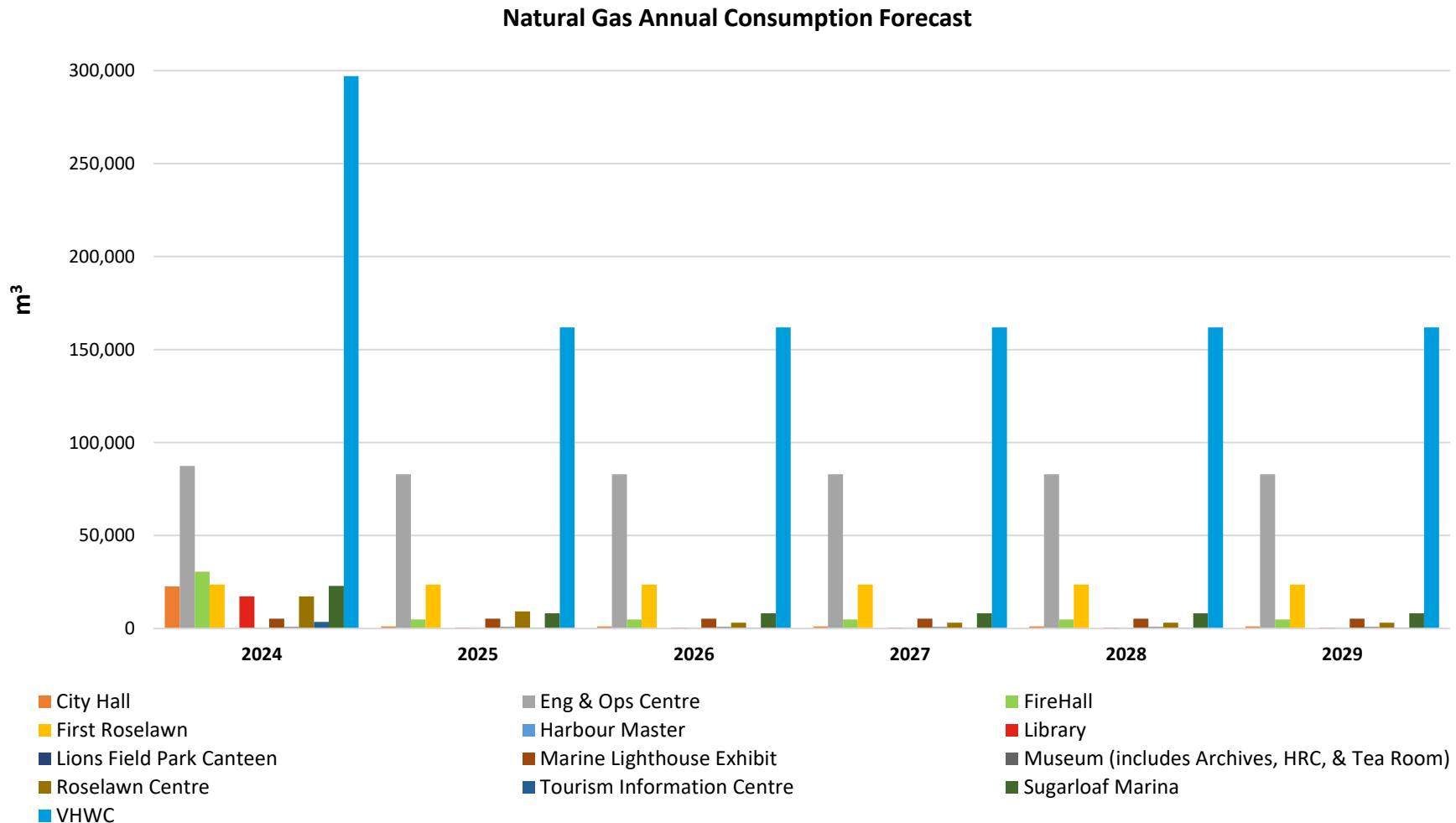


Figure 10. Natural Gas Consumption Forecast

### Electricity Annual Consumption Forecast

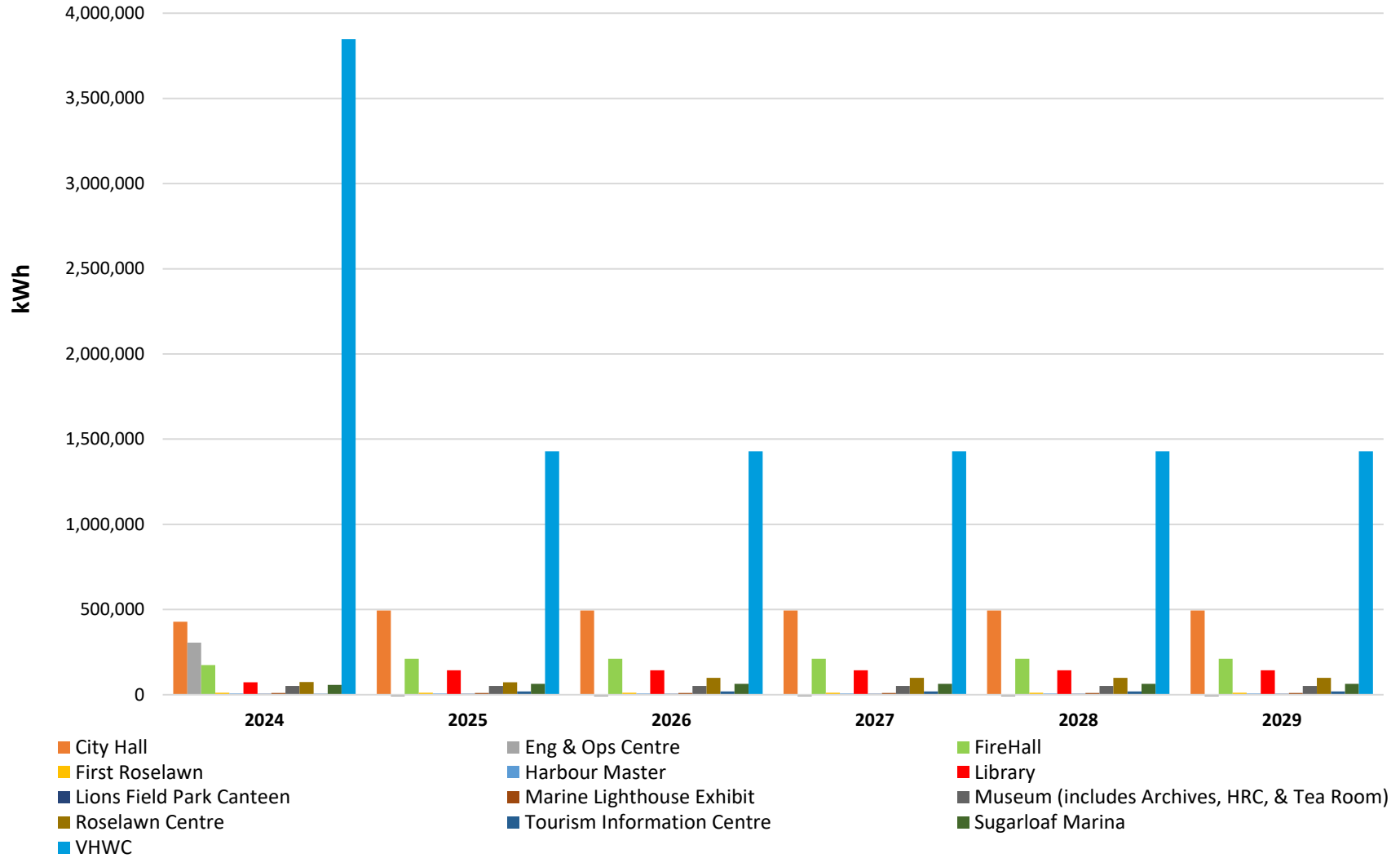


Figure 11. Electricity Consumption Forecast



Natural Gas (m <sup>3</sup> )	2024	2025	2026	2027	2028	2029
City Hall	22,635	1,094	1,094	1,094	1,094	1,094
Eng & Ops Centre	87,492	83,034	83,034	83,034	83,034	83,034
Firehall	30,549	4,927	4,927	4,927	4,927	4,927
First Roselawn	23,685	23,685	23,685	23,685	23,685	23,685
Harbour Master	0	0	0	0	0	0
Library	17,311	597	597	597	597	597
Lions Field Park Canteen	325	325	325	325	325	325
Marine Lighthouse Exhibit	5,341	5,341	5,341	5,341	5,341	5,341
Museum (includes Archives, HRC, & Tea Room)	821	821	821	821	821	821
Roselawn Centre	17,222	9,257	3,189	3,189	3,189	3,189
Tourism Information Centre	3,621	462	462	462	462	462
Sugarloaf Marina	22,869	8,264	8,264	8,264	8,264	8,264
VHWC	297,012	161,949	161,949	161,949	161,949	161,949
<b>Total</b>	<b>528,882</b>	<b>299,756</b>	<b>293,687</b>	<b>293,687</b>	<b>293,687</b>	<b>293,687</b>

Electricity (kWh)	2024	2025	2026	2027	2028	2029
City Hall	428,945	493,705	493,705	493,705	493,705	493,705
Eng & Ops Centre	305,410	-16,054	-16,054	-16,054	-16,054	-16,054
FireHall	174,455	211,460	211,460	211,460	211,460	211,460
First Roselawn	11,702	11,702	11,702	11,702	11,702	11,702
Harbour Master	7,745	7,745	7,745	7,745	7,745	7,745
Library	73,432	144,032	144,032	144,032	144,032	144,032
Lions Field Park Canteen	5,845	5,845	5,845	5,845	5,845	5,845
Marine Lighthouse Exhibit	10,047	10,047	10,047	10,047	10,047	10,047
Museum (includes Archives, HRC, & Tea Room)	51,216	51,216	51,216	51,216	51,216	51,216
Roselawn Centre	75,106	73,750	99,383	99,383	99,383	99,383
Tourism Information Centre	5,809	19,153	19,153	19,153	19,153	19,153
Sugarloaf Marina	57,384	64,487	64,487	64,487	64,487	64,487
VHWC	3,847,692	1,428,277	1,428,277	1,428,277	1,428,277	1,428,277
<b>Total</b>	<b>5,054,788</b>	<b>2,505,364</b>	<b>2,530,997</b>	<b>2,530,997</b>	<b>2,530,997</b>	<b>2,530,997</b>

Table 6. Natural Gas & Electricity Consumption Forecast

## 5.5. GHG Emissions Forecast

The forecasted greenhouse gas emissions are calculated based on the forecasted energy consumption data analyzed in the previous section and are tabulated in the following table. The percentage of reduction is based off the data from the baseline year of 2023.

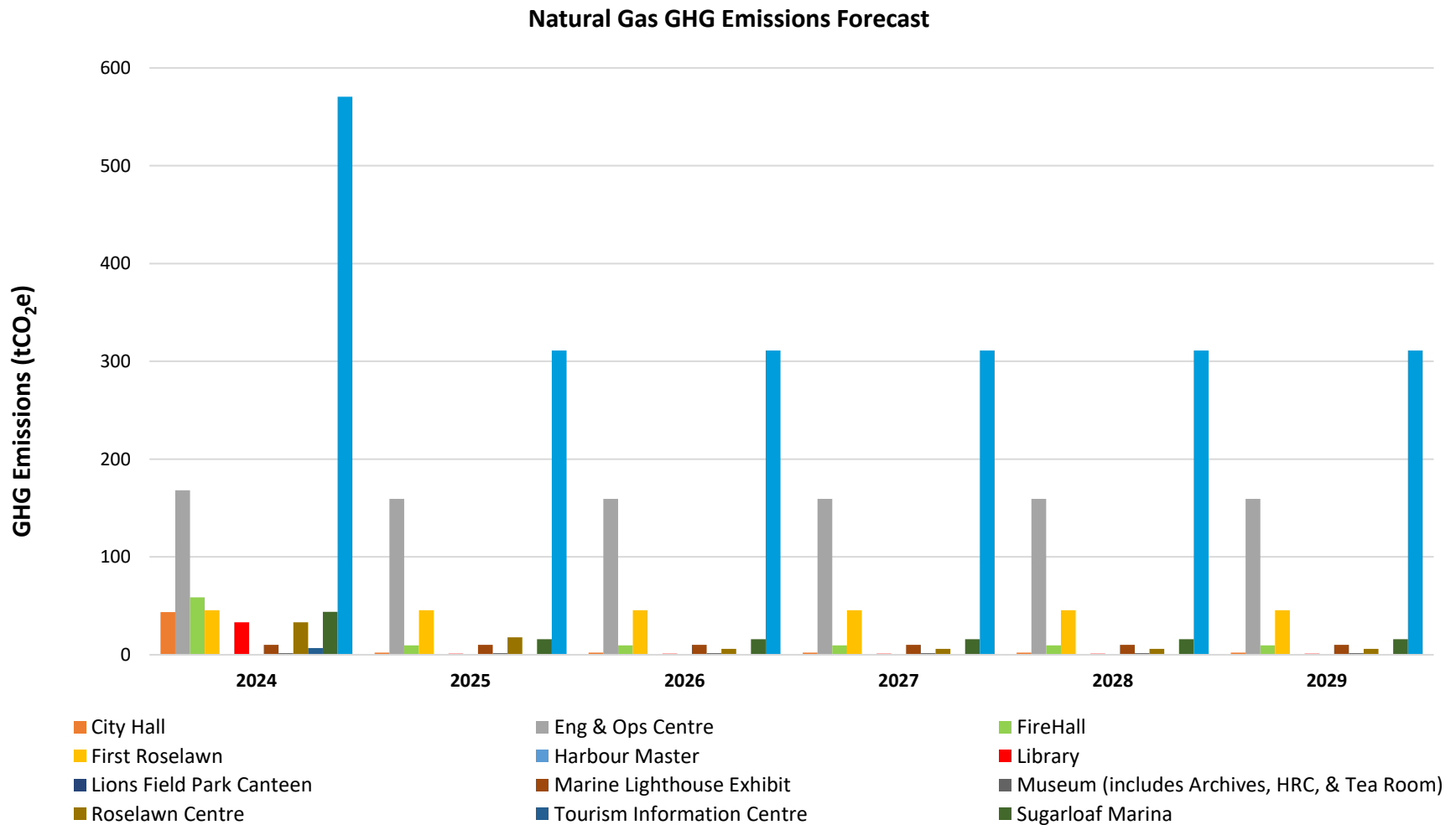


Figure 12. Natural Gas GHG Emissions Forecast

### Electricity GHG Emissions Forecast

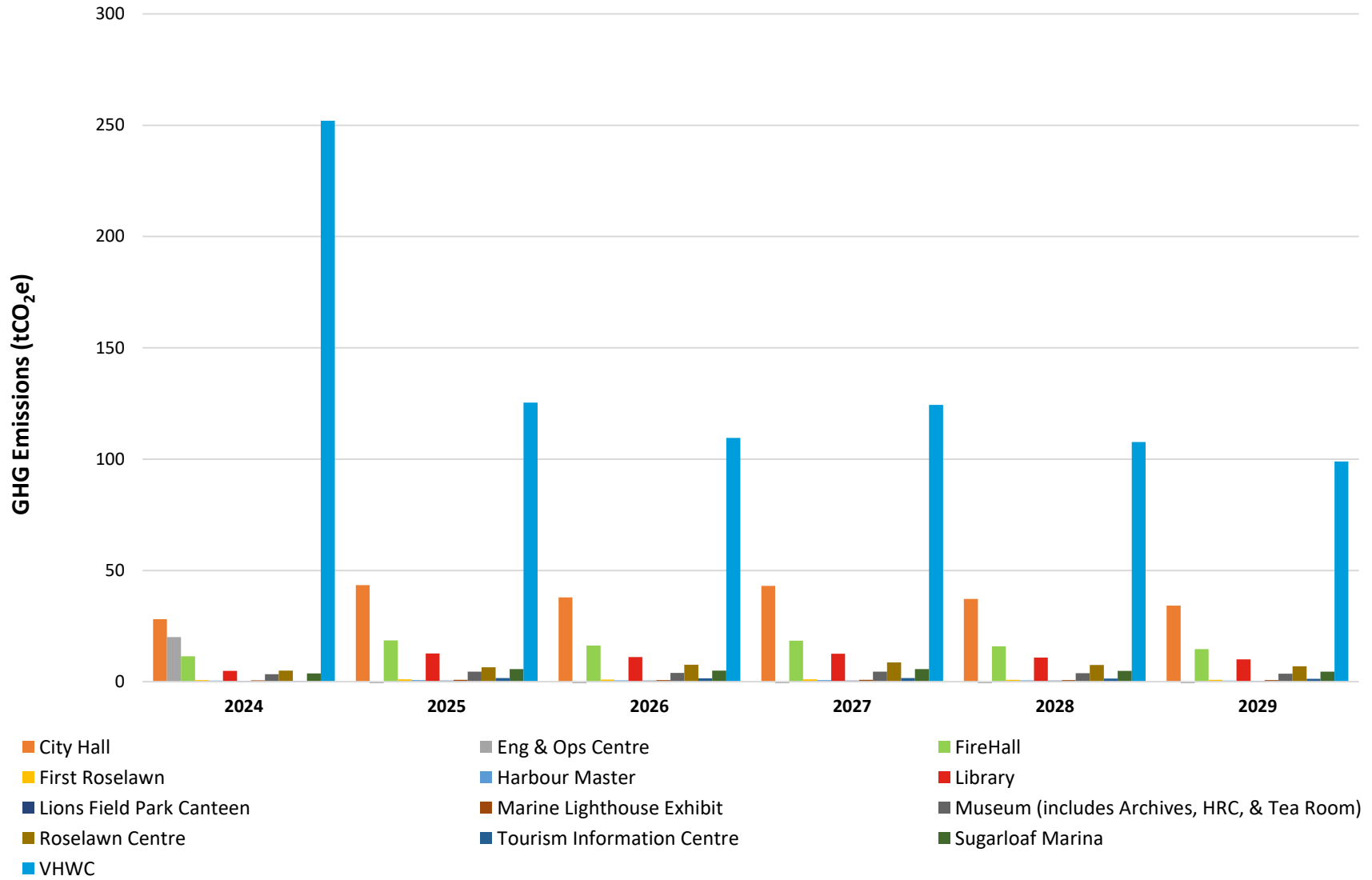


Figure 13. Electricity GHG Emissions Forecast

Natural Gas GHG Emissions (tCO <sub>2</sub> e)	2024	2025	2026	2027	2028	2029
City Hall	43	2	2	2	2	2
Eng & Ops Centre	168	160	160	160	160	160
Firehall	59	9	9	9	9	9
First Roselawn	45	45	45	45	45	45
Harbour Master	0	0	0	0	0	0
Library	33	1	1	1	1	1
Lions Field Park Canteen	1	1	1	1	1	1
Marine Lighthouse Exhibit	10	10	10	10	10	10
Museum (includes Archives, HRC, & Tea Room)	2	2	2	2	2	2
Roselawn Centre	33	18	6	6	6	6
Tourism Information Centre	7	1	1	1	1	1
Sugarloaf Marina	44	16	16	16	16	16
VHWC	571	311	311	311	311	311
<b>Total</b>	<b>1,016</b>	<b>576</b>	<b>564</b>	<b>564</b>	<b>564</b>	<b>564</b>

Electricity GHG Emissions (tCO <sub>2</sub> e)	2024	2025	2026	2027	2028	2029
City Hall	28	43	38	43	37	34
Eng & Ops Centre	20	-1	-1	-1	-1	-1
FireHall	11	19	16	18	16	15
First Roselawn	1	1	1	1	1	1
Harbour Master	1	1	1	1	1	1
Library	5	13	11	13	11	10
Lions Field Park Canteen	0	1	0	1	0	0
Marine Lighthouse Exhibit	1	1	1	1	1	1
Museum (includes Archives, HRC, & Tea Room)	3	4	4	4	4	4
Roselawn Centre	5	6	8	9	7	7
Tourism Information Centre	0	2	1	2	1	1
Sugarloaf Marina	4	6	5	6	5	4
VHWC	252	125	110	124	108	99
<b>Total</b>	<b>331</b>	<b>220</b>	<b>194</b>	<b>220</b>	<b>191</b>	<b>175</b>

Table 7. Natural Gas & Electricity GHG Emissions Forecast

# 6. The City of Port Colborne Outlook

## 6.1. Site-Wide Utility Consumption Forecast

By implementing the recommended measures stated in the previous section, in each respective site, COPC’s projected electricity and natural gas use could be forecasted based on the utility savings generated from individual measures. The forecasted utility consumption is tabulated below. The percentage of change is based on the data from the baseline year of 2023.

Fuel	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m <sup>3</sup> )	528,882	3%	299,756	45%	293,687	46%	293,687	46%	293,687	46%	293,687	46%
Electricity (kWh)	5,054,788	2%	2,505,364	51%	2,530,997	51%	2,530,997	51%	2,530,997	51%	2,530,997	51%

Table 8. Forecast of Annual Utility Consumption for all sites

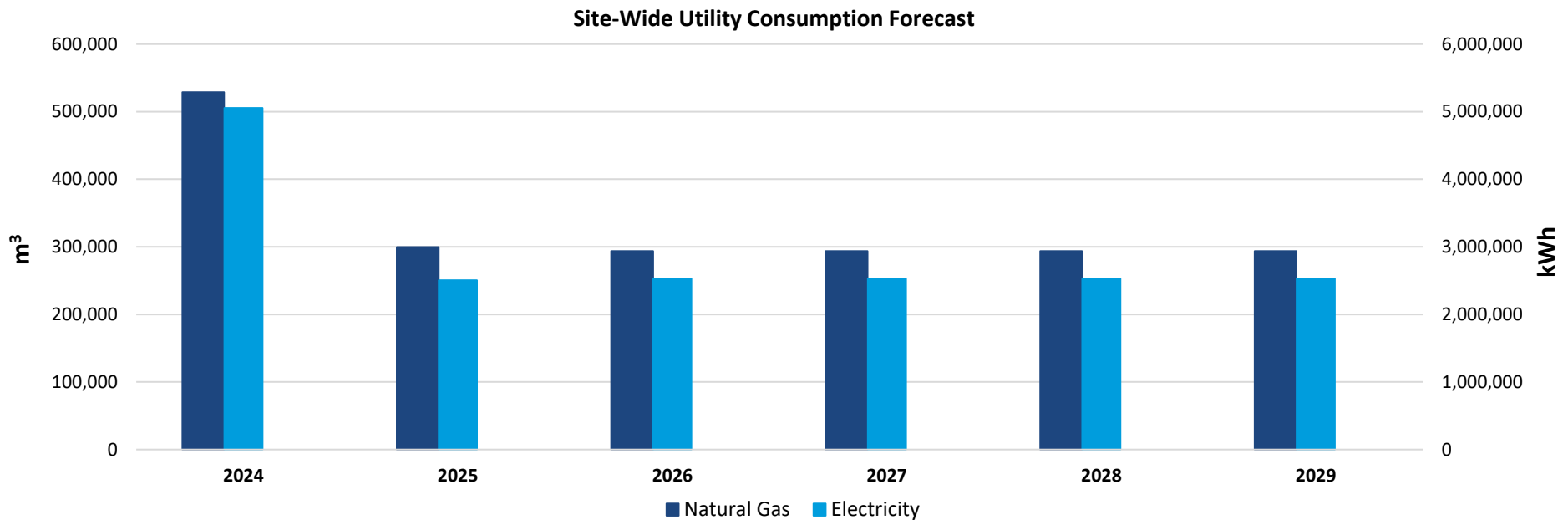


Figure 14. Forecast of Annual Energy Consumption

## 6.2. Site-Wide GHG Emissions Forecast

The organizational GHG emissions for COPC are calculated based on the forecasted Site-wide energy consumption data analyzed in the previous section and are tabulated in the following table. The percentage reduction is based on the baseline year of 2023.

Utility Source (tCO <sub>2</sub> e)	2024	2025	2026	2027	2028	2029
Natural Gas (Scope 1)	1,016	576	564	564	564	564
Electricity (Scope 2)	331	220	194	220	191	175
<b>Totals</b>	<b>1,347</b>	<b>796</b>	<b>758</b>	<b>785</b>	<b>755</b>	<b>740</b>
Reduction from Baseline Year	-15%	32%	35%	33%	36%	37%

Table 9. Forecast of Annual Greenhouse Gas Emissions from 2024 to 2029

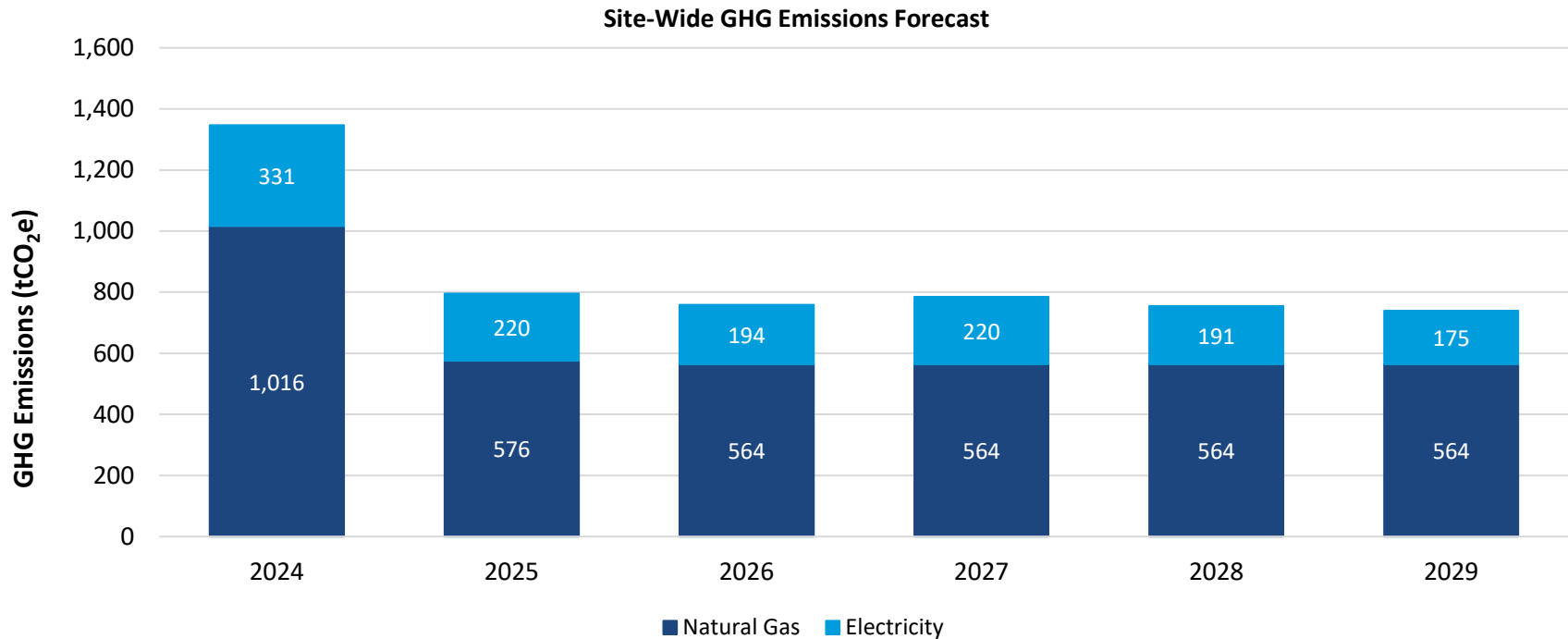


Figure 15. Forecast of Annual Greenhouse Gas Emissions



## 7. Closing Comments

Thank you to all who contributed to The City of Port Colborne's Energy Conservation & Demand Management Plan. We consider our facilities an integral part of the local community. The key to this relationship is being able to use our facilities efficiently and effectively to maximize our ability to provide the highest quality of municipal services while integrating environmental stewardship into all aspects of facility operations.

Public Works staff at the City of Port Colborne support approval of this Energy Conservation & Demand Management Plan, knowing that it will continue to be reviewed and updated to reflect the actions and plan of the City.

*This ECDM plan was created through a collaborative effort between The City of Port Colborne and Blackstone Energy Services.*

## 8. Appendix

### 8.1. Glossary

Word	Abbreviation	Meaning
Baseline Year		A baseline is a benchmark that is used as a foundation for measuring or comparing current and past values.
Building Automation System	BAS	<i>Building automation</i> is the automatic centralized <i>control</i> of a <i>building's</i> heating, ventilation and air conditioning, lighting and other <i>systems</i> through a <i>building management system</i> or <i>building automation system</i> (BAS)
Carbon Dioxide	CO2	Carbon dioxide is a commonly referred to greenhouse gas that results, in part, from the combustion of fossil fuels.
Energy Usage Intensity	EUI	Energy usage intensity means the amount of energy relative to a buildings physical size typically measured in square feet.
Equivalent Carbon Dioxide	CO2e	CO2e provides a common means of measurement when comparing different greenhouse gases.
Greenhouse Gas	GHG	Greenhouse gas means a gas that contributes to the greenhouse effect by absorbing infrared radiation, e.g., carbon dioxide and chlorofluorocarbons.
Metric Tonnes	t	Metric tonnes are a unit of measurement. 1 metric tonne = 1000 kilograms
Net Zero		A net-zero energy building, is a <a href="#">building</a> with zero net <a href="#">energy consumption</a> , meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of <a href="#">renewable energy</a> created on the site,
Variable Frequency Drive	VFD	A variable frequency drive is a device that allows for the modulation of an electrical or mechanical piece of equipment.

# 8.2. Tables and Figures

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